



Ecology of Stream Flow

Massachusetts Stream Flow Conference
Margaret Kearns, Riverways Program, DFG
April 29, 2005

Natural Flow Regime

Rate of Change



Magnitude

Timing



Duration

Frequency





changing flows change...

Habitat

Water Quality

Connectivity

Aquatic Life

Community Structure

Habitat



photo by James G. MacBroom

Water Quality





Habitat



Habitat



Beaver Brook, Waltham

Aquatic Life



Macrohabitat generalist

turtle_tails.tripod.com



Fluvial specialist

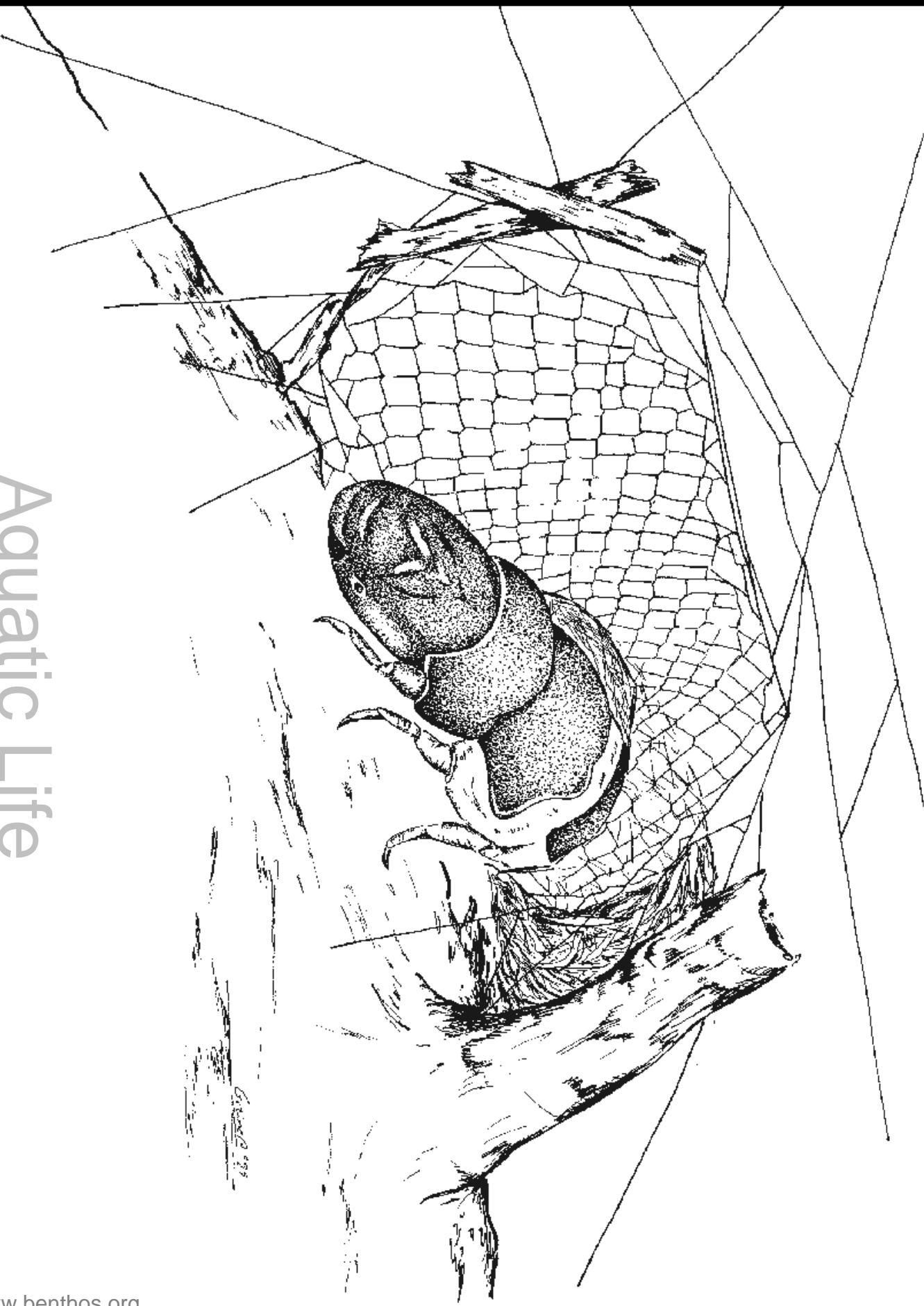
www.benthos.org



Fluvial dependent

www.gen.umn.edu/faculty_staff/hatch/fishes

Aquatic Life



Aquatic Life



Trout Nest

Community Structure



Mulinia coloradoensis
depends on the flow of fresh
water.



Chione cortezi prefers the saltier
conditions that exist without freshwater
inflow from the Colorado River.

(Photos taken from the Centro de Estudios de Almejas Muertas at the University of Arizona.)

Community Structure

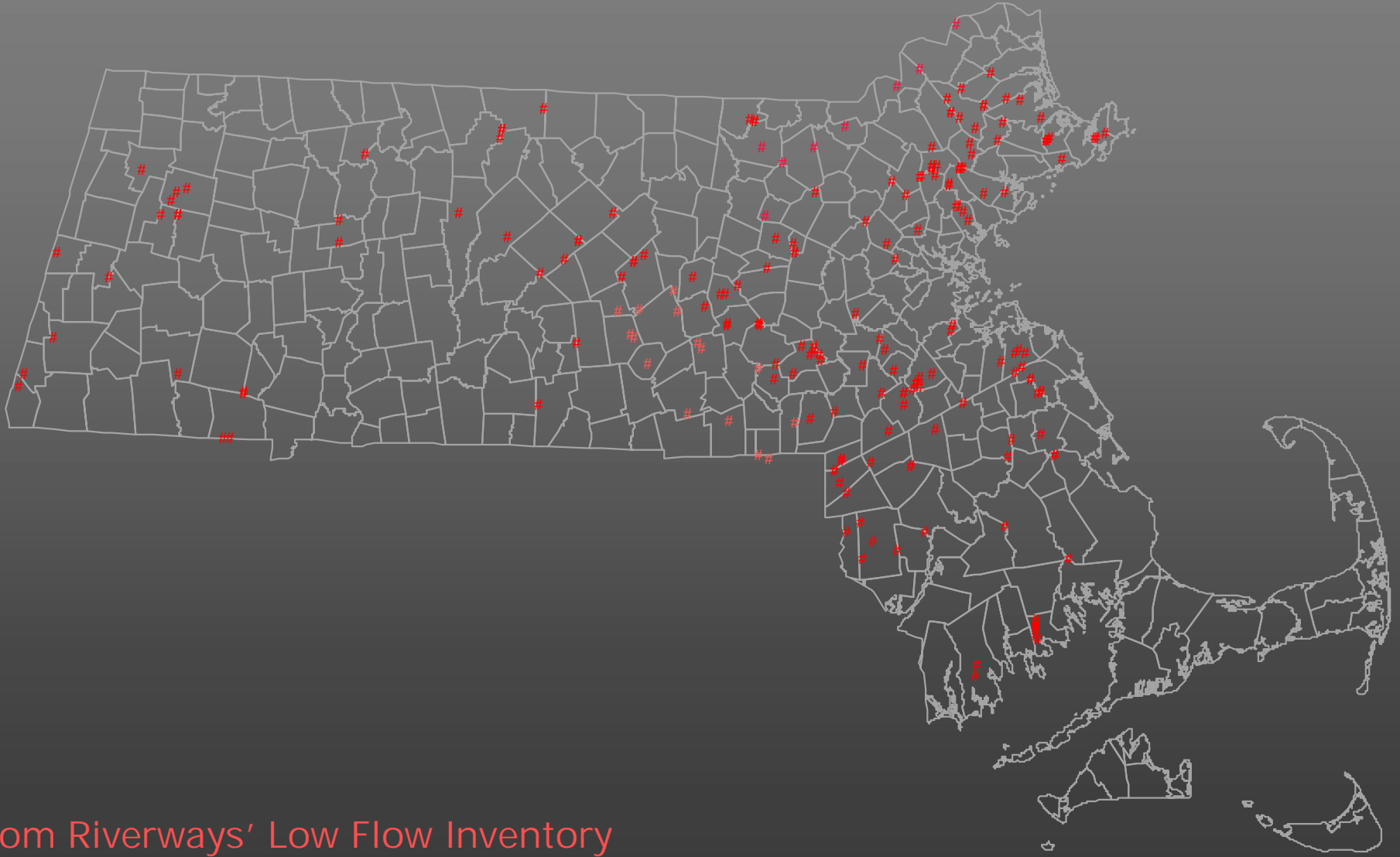


***Mulinia coloradoensis* shells**

(Photos taken from the Centro de Estudios de Altiplano Muerto at the University of Arizona.)

The Problem

Rivers With Abnormally Low Flow



From Riverways' Low Flow Inventory

http://www.mass.gov/dfwele/river/rivlow_flow_inventory/home.html

The Problem

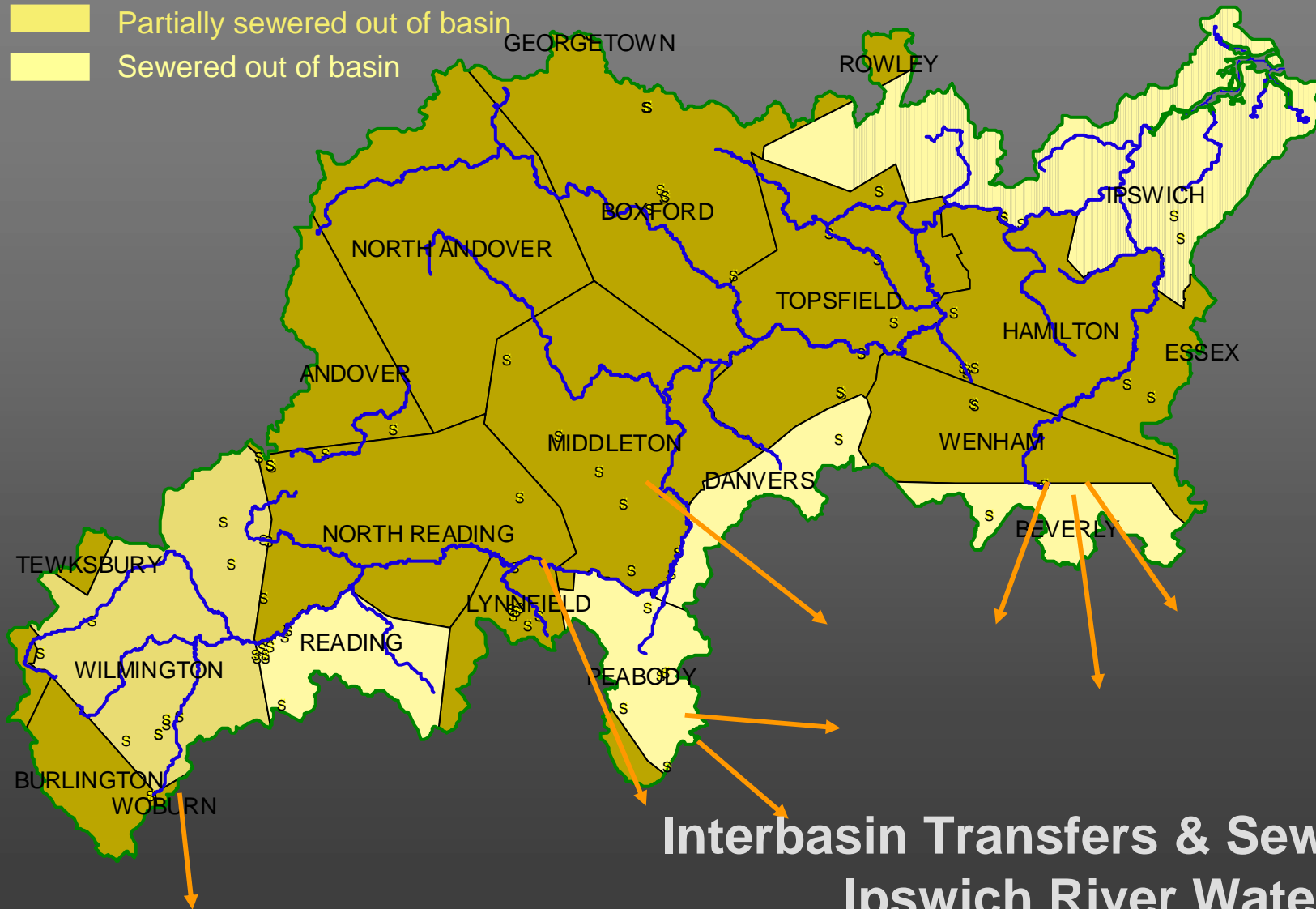
Dams



Egypt River, Rowley

The Problem

- Interbasin water supply transfer
- Water supply source
- Sewered in basin
- Partially sewered out of basin
- Sewered out of basin



**Interbasin Transfers & Sewering
Ipswich River Watershed**

80% of withdrawn water is transferred outside of the watershed

The Problem



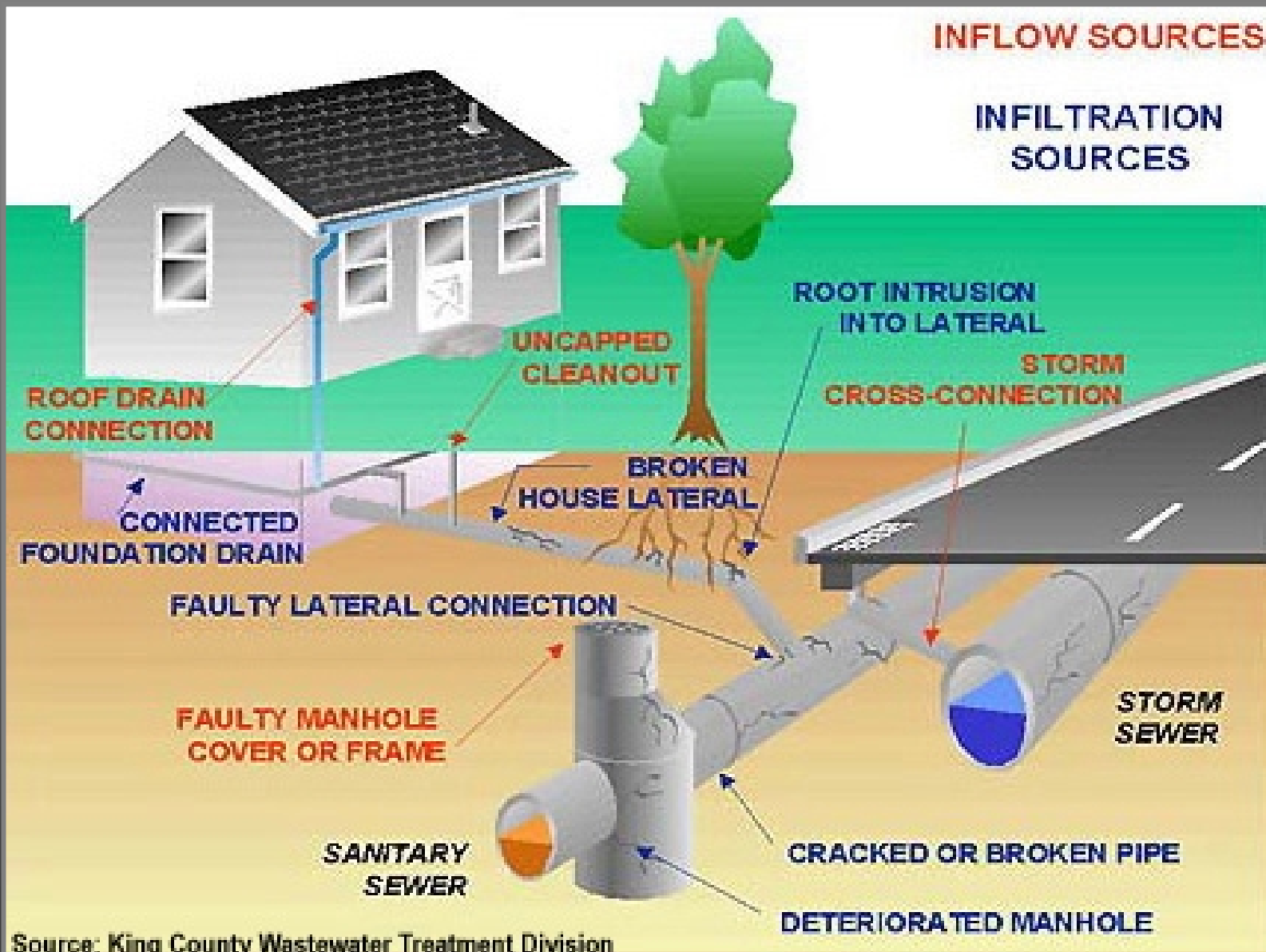
Water withdrawals from surface and groundwater

The Problem



Lawn Irrigation

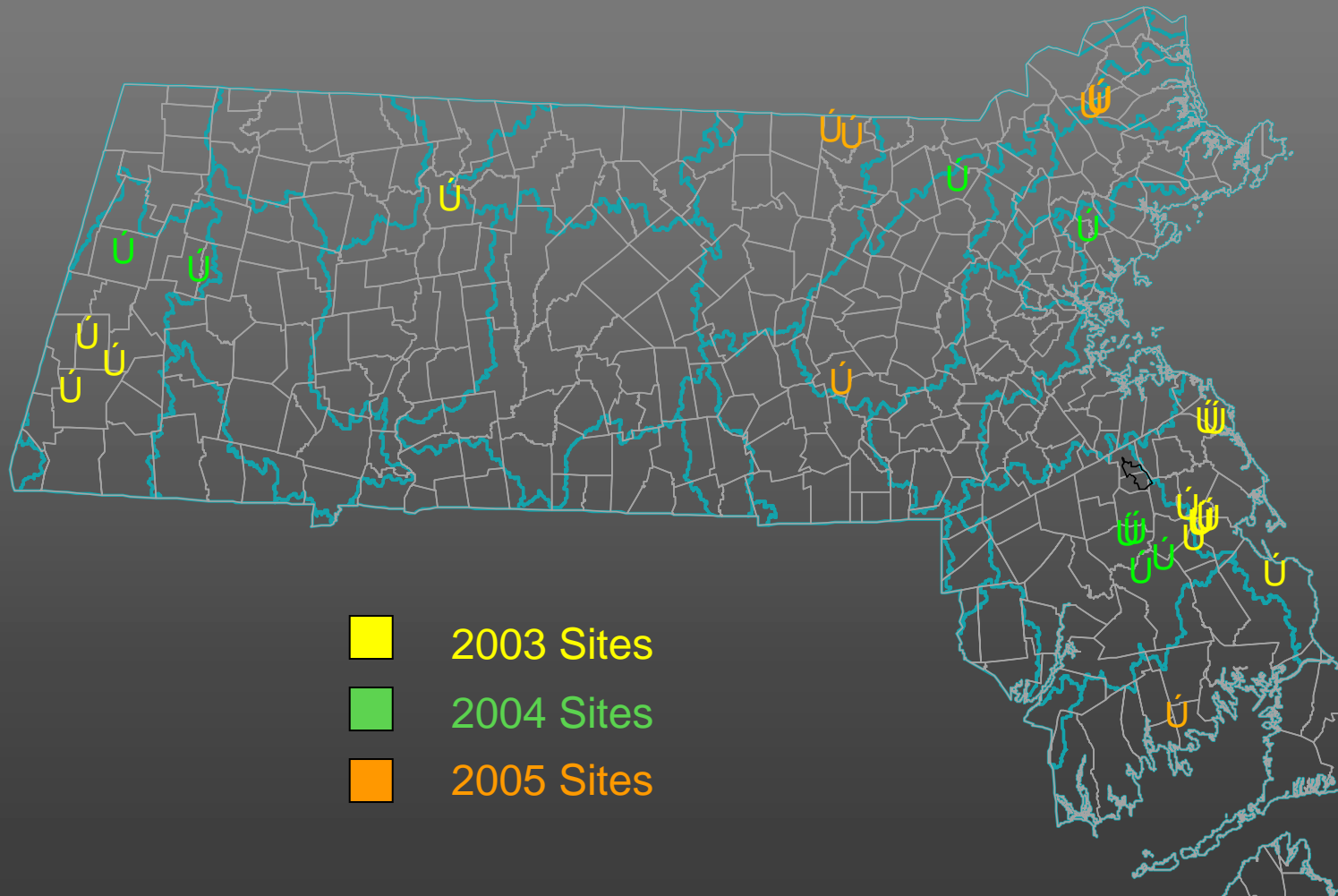
The Problem: Inflow & Infiltration



Source: King County Wastewater Treatment Division

dnr.metrokc.gov/wtd/i-i/whatis.htm

River Instream Flow Stewards (RIFLS) Stream Flow Monitoring Sites



The End



Platte River, Nebraska, 2002

Photo by: Beth Goldowitz, Platte River Whooping Crane Maintenance Trust